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Perspective

Civil–Military Collaboration in the Initial Medical Response to the Earthquake in Haiti

Paul S. Auerbach, M.D., Robert L. Norris, M.D., Anil S. Menon, M.D., Ian P. Brown, M.D., Solomon Kuah, M.D., Jennifer Schwieger, M.D., Jeffrey Kinyon, D.O., Trina N. Helderma, M.D., and Lynn Lawry, M.D.

Two days after Haiti's devastating earthquake, a medical relief team made up in part of four emergency physicians and four emergency nurses from Stanford University Hospital and three emergency

physicians from Columbia University Medical Center traveled under the auspices of the International Medical Corps, a non-profit organization based in Los Angeles, to provide emergency medical support. After an all-night bus ride from the Dominican Republic, the team arrived at the Hôpital de l'Université d'État d'Haiti in Port-au-Prince on the morning of January 17. The scene we faced was apocalyptic. Approximately 800 victims were within the hospital compound, most of them outdoors. A damaged building was filled with the patients deemed in greatest need of emergency surgery. Hundreds of patients awaited evaluation and treat-

ment. An internal medicine ward was packed with patients with crush and other severe soft-tissue injuries, amputations, open and infected fractures, compartment syndromes, hemorrhagic shock, and other conditions threatening to life and limb. In a central wooded area outside, the ground was barely visible for the suffering people, many of whom had distorted limbs, maggot-infested wounds, deforming facial injuries, skull fractures, and spinal cord injuries. A single operating room with a few tables was staffed by overworked surgeons who amputated limbs and débrided infected tissue. The morgue was overflowing, and approximately

40 bodies were stacked near the medical ward.

For the next 2 days, we practiced continuous battlefield medicine. Working side by side with a few other physicians and nurses, we did our best to evaluate every patient. Two of our physicians and two nurses initially staffed the preoperative area, one physician and a nurse cared for 60 to 80 critically ill patients in the ward, two physicians and a nurse triaged and treated the patients outside, and the remaining physicians and nurse assisted in areas of greatest immediate need. We carried backpacks filled with syringes of injectable narcotics and antibiotics to reduce pain when splinting shattered bones and to treat infections. We improvised by adding povidone-iodine to saline-filled intravenous bags to irrigate wounds before dressing them. We rapidly exhausted our



U.S. Soldiers Loading a Patient into a Military Medical Transport Vehicle for Transfer to the USNS *Comfort*.



Patients in a Military Medical Transport Vehicle Awaiting Transfer to the USNS *Comfort*.

supplies of splints and casting material. Since there was no cold chain (temperature-controlled supply chain), we could not store either tetanus toxoid or tetanus immune globulin. The stoic patients endured our treatments and thanked us.

On the second and third days, as access to the country and

hospital improved, American, Swiss, Canadian, Norwegian, Haitian-American, French, and Spanish volunteer physicians, predominantly from nongovernmental organizations and universities, arrived and worked side by side to bring order to patient flow. On January 20, the third day after our arrival, we

were awakened by an earthquake of magnitude 5.9. We raced to the hospital. By the time we arrived, the patients who had been inside the hospital had fled outdoors and new patients had entered the compound. We reevaluated as best we could. Although some of the newly abandoned buildings were subsequently cleared by engineers, the patients refused to reenter them. By midday, the ambient temperature was in the low 90s and the ground temperature higher. There were too few tarpaulins and tents to cover the patients. Without shade, the patients' condition deteriorated rapidly, and some of them had heatstroke. On that day, we diagnosed two cases of tetanus and many instances of gangrene. Without radiographs, facilities for laboratory tests, or other diagnostic capabilities, all diagnoses were made by physical examination.

For our first 3 days, there was minimal local law enforcement. The complexity of caring for so many seriously injured and ill patients was made worse by the commotion caused by the uncontrolled numbers of persons who gained access to the compound. On the third day, on the order of General Douglas Fraser, Commander of the U.S. Southern Command, 80 soldiers (including 5 medics) from C Company, 1st Battalion, 325th Airborne Infantry Regiment, were deployed from Fort Bragg, N.C., to the hospital. They remained for a few days and were then replaced by 130 other soldiers, including 10 medics, from B Company, 2nd Battalion.

With the arrival of the military, security was immediately established, including gate ac-



U.S. Soldiers Assisting in Medical Relief Efforts in Haiti.

cess, a perimeter surveillance, and crowd control. The soldiers' presence was an altogether positive development for the medical teams. By maintaining order and limiting the crowds of onlookers, they gave us more ready access to our patients. The military medics assisted us in evaluating and treating patients in the field and tents. They also carried stretchers and hauled supplies. When the U.S. Navy's hospital ship *Comfort* arrived on January 20, we began to transfer our sickest patients by navy helicopter to its more than 300 medical personnel, its operating rooms, and its 500 beds. We transferred 53 patients on the first day and another 95 during the rest of that week. In addition, the military airlifted 15 patients to the Baptist Haiti Mission Hospital (a transfer that until the arrival of the army had required a trip of 1 to 2 hours in the back of a pickup truck). Transferring patients to the *Comfort* required moving them first to waiting field litter ambulances (FLAs), each of which held four litters. The soldiers were essential in helping us move pa-

tients from the treatment areas to the FLAs. Once loaded, the patients were driven to a landing zone and then taken by helicopter to the *Comfort*. If we had not been able to transfer patients to the *Comfort*, many more lives would have been lost.

The support of the U.S. military was unequivocally integral to the success of the medical mission. The military supplied us with critical equipment and supplies, such as tents to establish our emergency room, stretchers, medications, food, and water. The soldiers who assisted us in the hospital compound brought not only skill but also a "can do" attitude and energy to a medical staff that was stretched to its physical and emotional limits. We saw consistent professionalism, competence, and compassion in the American soldiers.

There were challenges, too, in the civil-military collaboration, and we can apply the lessons learned to future disaster-response situations. As in most disasters, clarity of messaging was a problem. During the first day on which patients were air-

lifted to the *Comfort*, instructions from the ship regarding the number and types of patients to transfer were unclear. This issue was clarified the next day, when the navy provided a list of the types of cases that were best served by its facility (e.g., complicated extremity injuries, obstetric cases, and maxillofacial injuries) and those that were not (pelvic fractures, closed head injuries, complete spinal cord lesions, and cases requiring assisted ventilation). To facilitate patient flow and transfer, FLA locations and estimated times of arrival could have been better communicated. Although the delays were always understandable in the context of the disaster, the situation would have been improved by a clear and reliable form of communication between the civilian and military relief efforts at the ground level.

For the first week of transfers, we were not allowed to send patients' family members from the hospital to the *Comfort*. In a situation marked by chaos and profound social disruption, survivors, particularly children, may become separated from their families, so it is vitally important to try to keep families together. Initially there was no protocol for obtaining information from the ship on the status of transferred patients. It took several days to establish a hotline with the navy for this purpose. Disaster-relief planning should provide for communication channels between family members in such circumstances. It should also provide means of repatriating patients and reuniting families. Early consideration must be given to simple discharge planning, as well as to the creation of temporary residences to

receive patients who have been treated and stabilized, to open up precious hospital space.

Because the soldiers assigned to the hospital were always subject to immediate reassignment, we might have lost their help at a moment's notice. Fortunately, there was no lapse in coverage. There should, however, be soldiers whose main responsibility is to protect and support the medical mission and who are not subject to reassignment, unless the circumstances are dire.

We are aware of the complexity and sensitivity of interactions between nongovernmental organizations and the military. Nobody is perfect, and neither were we. But in this disaster response, the collaborative interaction between civilian medical teams and the military in responding to the initial casualties of the Haiti earthquake could serve to inform policies and procedures for future disasters. Working together, we achieved order out of chaos.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

From the Division of Emergency Medicine, Department of Surgery, Stanford University School of Medicine, Palo Alto, CA (P.S.A., R.L.N., A.S.M., I.P.B.); the Department of Emergency Medicine, New York–Presbyterian Hospital–Columbia University Medical Center, New York (S.K., J.S., J.K.); Lafayette Emergency Care, Lafayette, IN (T.N.H.); and the Office of the Assistant Secretary of Defense for Health Affairs, Falls Church, VA (L.L.).

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